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A Revision of the *Delias aroae-cuningputi* Complex (Lepidoptera, Pieridae)

2. The *D. cuningputi* group

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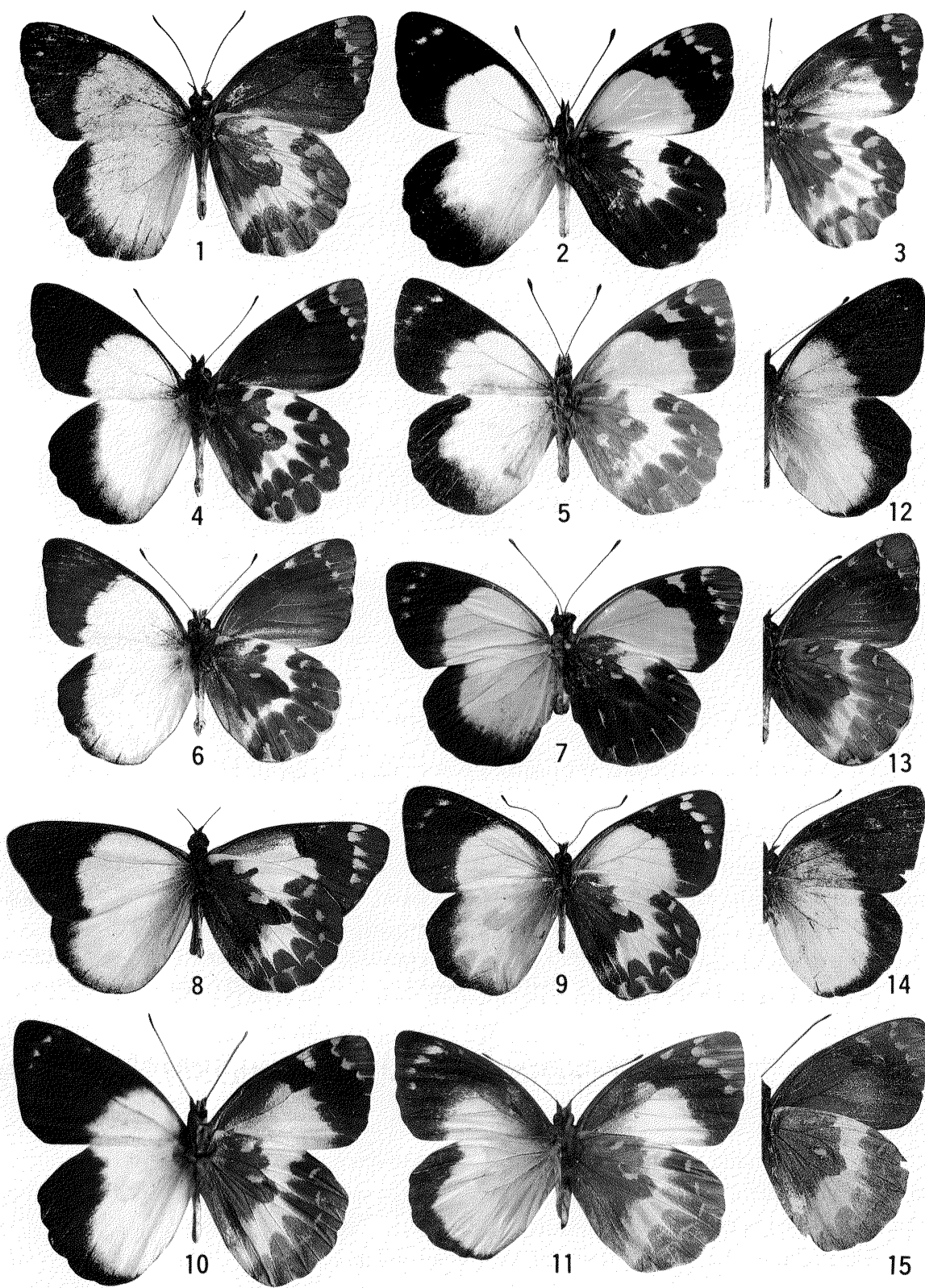
Abstract Continuing from Part 1 of this series we define the *Delias cuningputi* group from the highlands of the island of New Guinea and describe and figure the seven species-group taxa. For most taxa original type material is illustrated. Where appropriate we employ trinomial names as this does not present difficulties of the sort discussed in Part 1. We describe two new species; *D. konokono* and *D. chimbu*. *D. cuningputi aemula* JORDAN is synonymised with *D. cuningputi* RIBBE.

Intoroduction

This paper is a continuation of Part 1 (ORR and SIBATANI, 1985) where we define the *Delias aroae-cuningputi* complex and revise the *D. aroae* group. In this paper we revise the *D. cuningputi* group, which includes two new species from the central highlands of Papua New Guinea. The original descriptions of most forms are rather scant and given the wealth of comparative material which has since become available they are no longer adequate. We therefore include new descriptions of all previously described forms based where possible on original type specimens.

In Part 1 all taxa were written in binomial form because of the logical difficulties and arbitrary decisions that the use of trinomials entailed. Since patterns of geographical variation in the *cuningputi* group are relatively easy to interpret, we were not presented with such nomenclatural problems in this paper, hence where appropriate we employ a trinomial format. The same remarks on the use of characters we made in Part 1 apply here with the exception that we do not take into account the apical angle (defined in Part 1). Although considerable variation in this character does occur in this group it is too inconsistent to be of use.

Throughout the text following abbreviations are used to indicate sources of material: AM, Allyn Museum of Entomology, Sarasota, Florida; ANIC, Australian National Insect Collection, Canberra; BMNH, British Museum (Natural History),



London; IFTA, Insect Farming and Trading Agency, Bulolo, Papua New Guinea; RL, Rijksmuseum van Natuurlijke Historie, Leiden; AO, A. G. ORR collection; AS, A. SIBATANI collection; JG, J. K. GUYOMAR collection; PS, P. F. SAWYER collection; d, dorsal surface or upperside of wings; v, ventral surface or underside of wings.

Key to Males

1. Underside hindwing submarginal yellow/orange spots broad and roughly triangular, at least some of them reaching termen; hindwings usually not strongly scalloped or if so then both wings dusky brown above (*aroae* group)2
- Underside hindwing yellow/orange spots reduced to a thin bar, spot or crescent parallel to termen with thin lines radiating from their midpoints but seldom reaching termen; hindwings usually strongly scalloped13
- 2 – 12. See ORR and SIBATANI (1985).
13. Upperside pale yellow; underside hindwing without spot in Sc+R₁–Rs...*citrona*
- Upperside white or nearly white; underside hindwing with yellow spot in Sc+R₁–Rs14
14. Underside forewing discal cell predominantly white with black area basally and/or along anterior margin.....*jordani*
- Underside forewing discal cell entirely black or with faint suffusion of white only in distal end15
15. Upperside forewing white area measured along posterior cell margin at least half wing length16
- Upperside forewing white area less than half wing length18
16. Upperside white area with bluish-grey tinge; underside hindwing white median band broken in M₁–M₂*chimbu*
- Upperside ground colour pure white; underside hindwing median band continuous at least as far as CuA₂17
17. Upperside forewing black area covering distal part of cell.....*konokono*
- Upperside forewing black area does not enter cell*cuningputi*

Figs 1 – 15. 1: *Delias cuningputi* (RIBBE) ♂, lectotype. 2: *Ditto* ♀, Denglagu-Gunggugme. 3: *Ditto* ♂, underside only, Poketamanda. 4: *Delias konokono* sp. nov. ♂, holotype. 5: *Ditto* ♀, paratype, Kundiawa. 6: *Delias chimbu* sp. nov. ♂, holotype. 7: *Ditto* ♀, paratype. 8: *Delias jordani* KENRICK ♂, holotype. 9: *Ditto* ♀, Angi Lakes. 10: *Delias fascelis ibelana* ROEPKE ♂, holotype. 11: *Delias fascelis fascelis* JORDAN ♀, paralectotype. 12: *Ditto* ♂, lectotype, right wing upperside. 13: *Ditto*, left wing underside. 14: *Delias citrona* JOICEY & TALBOT ♂, holotype, right wing upperside. 15: *Ditto*, left wing underside. All figures natural size. Difference in colour of the white uppersides may be due to different photographic conditions. Unless otherwise indicated left wings are shown, upperside on the left, underside on the right side.

18. Underside forewing discal area black *fascelis*
 — Underside forewing discal area pure white or with a medium black
 suffusion *ibelana*

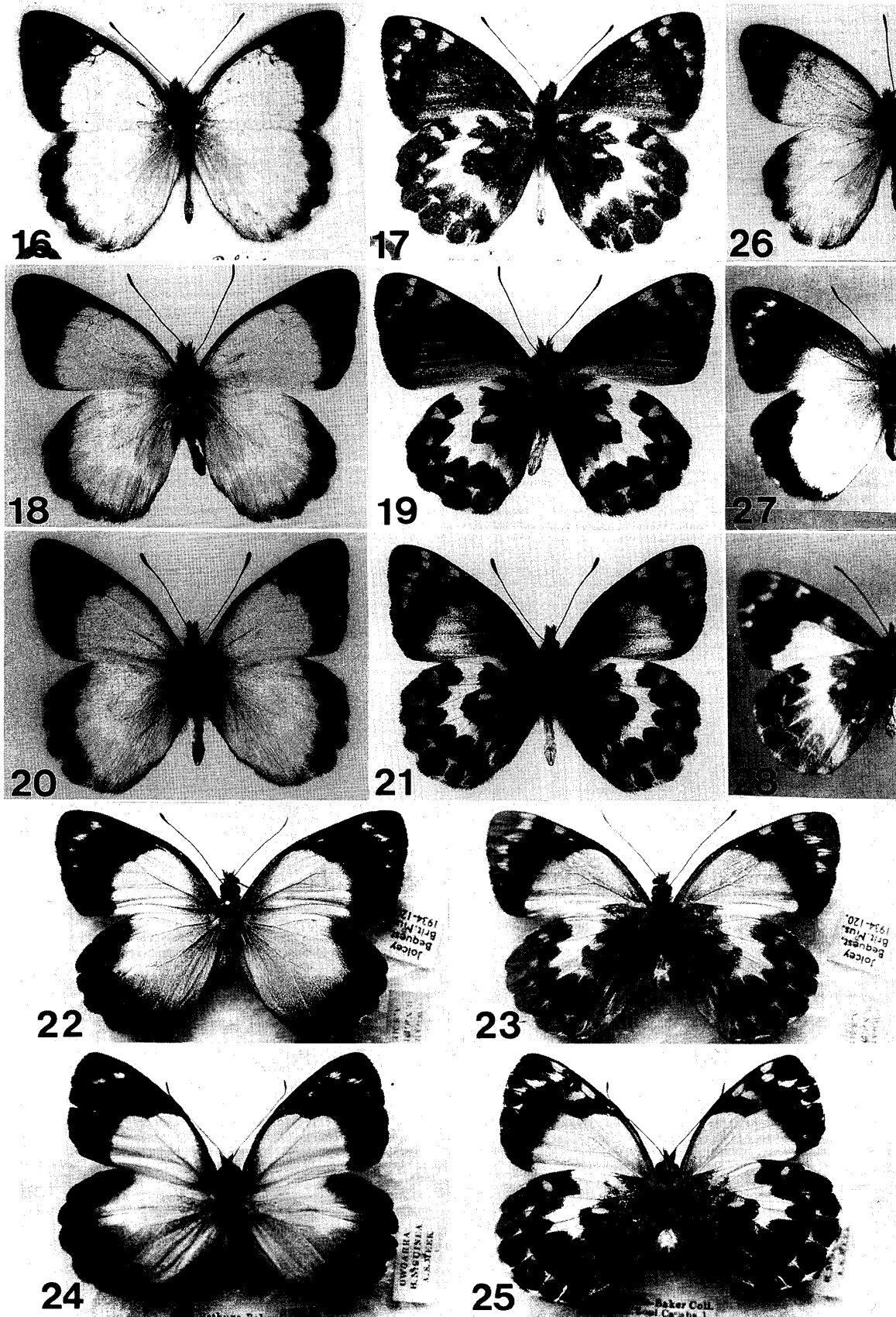
Key to Females

1. Underside hindwing submarginal yellow/orange spots broad and
 roughly triangular, at least some of them reaching termen; hindwings
 usually not strongly scalloped or if so then both wings mostly dusky
 brown above (*aroae* group) 2
 — Underside hindwing yellow/orange spots reduced to a thin bar, spot or
 crescent parallel to termen with thin lines radiating from their
 midpoints but seldom reaching termen; hindwings usually strongly
 scalloped 10
 2 – 9. See ORR and SIBATANI (1985).
 10. Underside forewing discal area bright orange-yellow 11
 — Underside forewing discal area not as above 13
 11. Underside hindwing white median band reaching dorsum *konokono*
 — Underside hindwing white median band not reaching dorsum 12
 12. Underside hindwing median band reaching CuA₁ *cuningputi*
 — Underside median band not crossing M₂ *chimbu*
 13. Upper and underside forewing discal cell almost entirely white *jordani*
 — Upper and underside forewing cell mostly black 14
 14. Underside forewing discal white area with a yellowish tinge;
 postmedian costal spot yellow, not reaching M₂ *fascelis*
 — Underside forewing white area without yellowish tinge; postmedian
 costal spot white, reaching M₂ *ibelana*

D. cuningputi Group

The *Delias aroae-cuningputi* complex (comprising the *D. aroae* and *D. cuningputi* groups of species) and the *D. aroae* group have been defined previously (ORR & SIBATANI, 1985). The *D. cuningputi* group may be distinguished from the *D. aroae* group by the features indicated in the preceding keys. In addition members of the *cuningputi* group tend to be larger, and possess a longer fringe of scales on the hindwing. The hindwing black border in females is not dimorphic and in males it is

Figs 16–28. *Delias cuningputi* (RIBBE) and *Delias fascelis ibelana* ROEPKE. 16: *Delias cuningputi aemula* JORDAN ♂, lectotype, upperside. 17: *Ditto*, underside. 18–26. *Delias cuningputi* (RIBBE). 18: ♂, Wau, iii. 1973, upperside. 19: *Ditto*, underside. 20: ♂, Gembogl, upperside. 21: *Ditto*, underside. 22: ♀, Owgarra, upperside. 23: *Ditto*, underside. 24: ♀, Owgarra, upperside. 25: *Ditto*, underside. 26: Upperside of Fig. 3, ♂, Poketamanda. 27: *Delias fascelis ibelana* ROEPKE ♀, “allotype”, upperside. 28: *Ditto*, underside.



usually not broken into a series of spots towards the tornus. The uncus (figured in TALBOT, 1929, plate 2, fig. 35) is longer and narrower than in the *aroae* group. There are six species, one of which (*citrona*) is of doubtful status and one in which we recognise two geographical races (*fascelis*). The range of variation is somewhat less than in the *aroae* group and we have not divided it above the species level.

Delias cuningputi (RIBBE), 1900

(Figs 1, 3, 16–21, 26, ♂♂; Figs 2, 22–25, ♀♀)

Pieris cuningputi RIBBE, 1900: 308 ♂.

Delias cuningputi RIBBE: GROSE-SMITH & KIRBY, 1901: 30–31, pl. *Delias* 9, figs 9, 10 ♂dv; ROTHSCHILD, 1904: 3–34, pl. 2, figs 5, 6 ♀dv; FRUHSTORFER, 1909–1911: 129, pl. 56e ♂v.

Delias cuningputi cuningputi RIBBE: TALBOT, 1929: 186–187, pl. 21, fig. 35 androconia; TALBOT, 1932: 83; ROEPKE, 1955: 202; D'ABRERA, 1971, 1978: 133 ♀v.

Delias cuningputi aemula JORDAN, 1930: 278–279, **Syn. nov.**; TALBOT, 1932: 83; 1937: 586; ROEPKE, 1955: 202; D'ABRERA, 1971, 1978: 133.

Types — *Pieris cuningputi* RIBBE, *lectotype* (here designated) ♂, PAPUA NEW GUINEA: Central Province — labelled “Aroa R., Brit. N. G. (Weiske.)/Original [blue label]”; *paralectotype* 1 ♂ with the same label data except for blue “original” label, both in the Rothschild Collection housed in the British Museum (Natural History). *Delias cuningputi aemula* JORDAN; *lectotype* (here designated) ♂, PAPUA NEW GUINEA: Morobe Province — labelled “Edie Creek, Westside of Herzog Mts., 6100 ft., early 1928. A. F. EICHHORN. /*Delias cuningputi aemula* Type. Jord. Nov. Zool. 1930./Type”; *paralectotypes* 3 ♂♂, all in the British Museum (Natural History).

Other material examined — PAPUA NEW GUINEA: Central Province — Tapini area, 14 ♂♂ Loloipa River Bome 1900 m 25. ii. – 2. v. 1958 BRANDT ANIC, 1 ♂ Angabunga R. 1800 m upwards xi. 1904 – ii. 1905 MEEK BMNH — Woitape area, Kosipe, 3 ♂♂ 23. viii. – 10. x. 1971 M. CAMPBELL (*JAE*) AM, 2 ♂♂ 23. ix., 4. xi. 1971 AS, 1 ♂ 3 ♀♀ Owgarra, MEEK (*JOICEY* partly also BETHUNE-BAKER) BMNH; Morobe Province — Wau area, 2 ♂♂ 1500 m iii. 1973 OHLMUS AS, Mt Kaindi 2000 m 1 ♂ BRANDT ANIC, 5 ♂♂ 3 ♀♀ Dec. 1973 A. G. ORR AO, 1 ♂ 13. iii. 1973 DAVIES BMNH; Eastern Highlands Province — Frigano, 1 ♂ 2100 m 1. x. 1972 P. F. SAWYER AO, 1 ♂ 2300 m 1. x. 1972 JG, 1 ♂ Mt Michael 2300 m SAWYER PS; Chimbu Province — Kerowagi area, 2 ♂♂ (*JAE*) AM, 1 ♂ iii. 1969 EBNER BMNH, 1 ♂ ix. 1981 IFTA/AS, 2 ♂♂ iv. 1981 JG — Denglagu-Gunggugme 5.56S 145.01E, 1 ♂, 1 ♀ Catholic Mission viii./no date 1982 IFTA/AS — Gembogl, 1 ♂ Bomakane vi. 1982 IFTA/AS; Western Highlands Province — Lai River (Wabag area) 2 ♂♂ Poketamanda 2600 m 4. vii. 1965 SAWYER PS; 1 ♂ no data (GROSE-SMITH) BMNH.

Male — Forewing 23–29 mm. Upside: black border of variable width and shape but never extending into forewing cell; forewing subapical spots present or absent; hindwing black border of variable width, tapering gradually towards tornus; its margin may be smooth or wavy. Underside: forewing postmedian costal spot very

variable; disc ranges from white with a light suffusion of black scales to almost completely black; hindwing white median band usually rather broad, continuous at least as far as CuA_2 and extending along costa towards wing base to be continuous with yellow spot in $Sc+R_1-Rs$; yellow spotting in median band may be reduced; proximal black area may extend beyond cell only in anterior part of base of M_2-M_3 .

Males of *D. cuningputi* are highly variable. Several geographical forms may be recognised and generally specimens can be accurately assigned to their respective populations. However variation at most localities is considerable and between populations characters may vary irregularly and independently of each other. Moreover, as we do not know the degree of geographical or phenotypic continuity between populations we do not treat these forms as formal subspecies but list them below and describe their definitive features. It is not certain whether females exhibit regular patterns of geographical variation.

1. Typical *cuningputi* (Fig. 1): Tapini – Woitape population — Forewing 25–29 mm. Upperside: forewing black border relatively broad; margin with convex section towards costa touching cell end at M_2 ; prominent subapical white spots. Underside: forewing disc almost completely black; hindwing white median band reaching dorsum but not entering cell, margin diffuse, yellow markings absent or very faint in R_s-M_1 and M_1-M_2 .

2. Wau population (Figs 16–19, JORDAN's *aemula*) — Forewing 27–28 mm. Upperside: forewing with black border narrower than 1, 2–3 mm from cell end, margin concave throughout; subapical spots usually weak or absent. Underside: forewing disc black, rarely white with suffusion of black scales; hindwing similar to 1 but with yellow markings usually present in R_s-M_1 and M_1-M_2 .

3. Mt Michael/Frigano population — Rather variable. Forewing 23–27 mm. Upperside: forewing black border may be similar to 1 or broader, its margin contiguous with cell end along its length and concave throughout. Underside: forewing as in 1; hindwing median band well defined, may reach dorsum or may terminate at $1A+2A$; yellow spotting as in 2.

4. Chimbu population (Figs 20, 21) — Forewing 26–27 mm. Upperside may be similar to 1, 2 or 3. Underside: forewing disc white, with lighter suffusion of black scales than 2 but white area less extensive than when it occurs in 2; hindwing median band more reduced than 3 usually not extending caudad of CuA_2 ; yellow spotting reduced as in 1.

5. Poketamanda population (Figs 3, 26) — Forewing 27 mm. Upperside: forewing black border 3–4 mm from cell end, its margin irregular and almost straight rather than smooth and convex as in 2; subapical spots present; hindwing border narrow, tapering to meet wing edge halfway along termen. Underside: forewing white discal patch more extensive than 2 or 4; hindwing median band broad, entering cell and reaching dorsum, with diffuse margins and well developed yellow spots.

Female — Forewing 25–28 mm. Females are known for 1, 2 and 4 and do not differ greatly. Upperside: black border much wider than any male forms; forewing always with well developed subapical spots; hindwing with uniform black border,

wide on dorsum. Underside: forewing disc chrome yellow; variable yellow postmedian costal spot; hindwing median band tapering sharply caudad and ending at CuA₁. Variation within populations occurs in the development of the postmedian costal spot (Figs 23, 25) on the forewing and the definition of the median band on the hindwing.

Distribution — Papua New Guinea, 1500–2600 m, Wabag area (Western Highlands) to Tapini in the Owen Stanley Range and possibly further east. Additional locality records include Mandandurugl, Kawa Aid Post and Bogo Mission (all near Kerowagi, Chimbu Province; M. PARSONS, *in litt.*) and Daulo Pass (Eastern Highlands; P. SAWYER, *in litt.*). In many localities *D. cuningputi* is sympatric with *D. konokono* and/or *D. chimbu*.

Remarks — As *aemula* falls within the range of variation of the species and often cannot be separated from other populations with certainty we treat it as a subjective synonym of *cuningputi*.

***Delias konokono* sp. nov.**

(Fig. 4 ♂, Fig. 5 ♀)

Types — *Holotype* ♂ (ANIC Type No. 3312), PAPUA NEW GUINEA: Madang Province — labelled “NEW GUINEA Eastern Highland. Mt. Wilhelm. Pengal River. 9200 ft. [2800 m], 16.5–9.6. 1963 W. W. Brandt”, in Australian National Insect Collection; *paratypes* 28♂♂ 3♀♀, 5♂♂ 1♀ with same label data as holotype, ANIC; Central Province — Tapini area, 4♂♂ Loloipa River Bome 2450 m 25. ii. – 2. v. 1958 W. W. BRANDT ANIC; Eastern Highlands Province — 1♂ Marifunga 2600 m 24. vi. 1973 P. F. SAWYER AO; Morobe Province — 4♂♂ Waria Valley 21. v. 1979 (M. SIMON) AM; Chimbu Province — Mt. Wilhelm, 1♀ South Slope 2900 m 15. vi. 1950 E. T. GILLIARD (L. J. SANFORD) BMNH — Kerowagi, 3♂♂ (JAE) AM, 2♂♂ vi. 1981, vi. 1982 IFTA/AS, 1♂ iv. 1981 JG — Kundiawa, 1♀ v. 1982 IFTA/AS — Gembogl, 8♂♂ 17. viii. – 3. ix. 1976 JG.

Male — *Holotype* — Forewing 28 mm. Upperside: black border wide; forewing, margin of black area strongly convex distad, smooth, entering cell at base of M₃ and arching back along costa; subapical spots absent. Underside: forewing disc black with very light suffusion of white scales; postmedian costal spot broad and extending as far as M₂; hindwing proximal black area fills base of M₂–M₃ along length of lower discocellularis; median band narrow, well defined, continuous to dorsum and continuing along costa as in *cuningputi*, yellow markings present in each space caudad of Rs.

Other males — Forewing 27–29 mm. Similar to holotype, differing on the underside in the degree of white suffusion in the forewing disc, the development of the postmedian costal spot and the extent of the hindwing median band which may only reach 1A+2A.

Female — Forewing 26.5 mm. Upperside: similar to female *cuningputi*. Underside: forewing disc paler yellow than *cuningputi*; postmedian costal spot broad,

of uniform width and extending to M_2 , white cephalad of M_1 and yellow in $M_1 - M_2$; hindwing median band reaches dorsum.

Distribution — Papua New Guinea, altitudes above 2300 m. Recorded from Mt Wilhelm and localities to the east and south in the Central and Eastern Highlands and at Bome near Tapini in the Owen Stanley Range. It is likely to be discovered at intermediate localities. The following localities have been recorded: Mandandurugl, Kawa Aid Post and Bogo Mission near Kerowagi, Bomakane near Gembogl (Chimbu; M. PARSONS, *in litt.*); Mt Michael, Mt Otto 2300 m and Daulo Pass 2450 m (Eastern Highlands; P. F. SAWYER, *in litt.*). *D. konokono* occurs together with *cuningputi* at many of these localities and also with *chimbu* near Kerowagi. In general however *D. konokono* flies at higher altitudes than the other two species.

Remarks — *D. konokono* is very similar to *D. cunningputi* and *D. chimbu* but in the male may be distinguished from the former by the broader black margin on the upperside of both wings, and by the intrusion of the proximal black area into the white median band on the underside of the hindwing. The female may be distinguished by the white median band which almost reaches the dorsum. (For distinction from *chimbu* see the following description of that species.)

The specific name *konokono* means butterfly in the Chimbu language.

***Delias chimbu* sp. nov.**

(Fig. 6 ♂, Fig. 7 ♀)

Delias cunningputi (RIBBE): LEWIS, 1973: 274, pl. 159, fig. 10. [misidentification].

Types — *Holotype* ♂ (ANIC Type No. 3313), PAPUA NEW GUINEA: Western Highlands Province — Wahgi River, labelled "NEW GUINEA Nondugl (Central Highlands) 5000 ft. [1500 m] November 6 1950 Collected by Wm. Brandt E. J. L. Hallstrom", in Australian National Insect Collection; *paratypes* 7 ♂♂ 1 ♀, PAPUA NEW GUINEA: Chimbu Province — Kerowagi area, 1 ♂ Siwi Kambu Kawa vi. 1982, 1 ♂ Modadural vi. 1982 Wau Keranga IFTA/AS — Kundiawa, 1 ♂ iii. 1982 IFTA/AS; Western Highlands Province — Wahgi River, 2 ♂♂ with same label data as holotype ANIC, 2 ♂♂ 1 ♀ Wahgi Divide 1800 m v. 1955 A. P. DODD BMNH.

Male — *Holotype* — Forewing 26 mm. Upperside: white area often slightly bluish-grey; forewing black border 1 mm from cell end, its margin weakly concave and narrower on dorsum than other forms (except *cuningputi* type 5); subapical spots absent; hindwing black margin narrow, its boundary smooth, terminating mid $CuA_1 - CuA_2$. Underside: forewing disc black with light suffusion of white towards tornus and on veins; postmedian costal spot not in $M_1 - M_2$; hindwing median white band with diffuse margins, reaching termen but broken in $M_2 - M_3$ by a pointed, distad extension of the proximal black area and again in $CuA_2 - 1A + 2A$; yellow spots only in $CuA_1 - CuA_2$ and $CuA_2 - 1A + 2A$; white area extending along costa as in *cuningputi*. Other males: forewing 25 mm, similar to holotype.

Female — Forewing 26 mm. Upperside: forewing similar to *cuningputi*;

hindwing black border margin smoother than preceeding two species. Underside: forewing postmedian costal spot yellow, tapering to a point on M_2 ; disc chrome-yellow as in *cuningputi*; hindwing median band reduced, tapering to a point on M_2 .

Distribution — Papua New Guinea, restricted to the Wahgi Divide (Chimbu and Western Highlands) above 1500 m. This species is sympatric with both *D. cuningputi* and *D. konokono* at Mandandurugi and Kawa Aid Post (both near Kerowagi; M. PARSONS, *in litt.*).

Remarks — *D. chimbu* is very similar to *D. konokono* and *D. cuningputi* with which it has sometimes been confused. It may however be distinguished immediately from these two species by the white median band on the underside of the hindwing which, in the male, is interrupted in M_2-M_3 and, in the female, is terminated on M_2 .

The specific name *chimbu* is the name of a major tribe in the central highlands of Papua New Guinea.

Delias fascelis fascelis JORDAN, 1911 stat. rev.
(Fig. 11 ♀, Figs 12 and 13 ♂)

Delias fascelis JORDAN, 1911: 587–588. ♂, ♀.

Delias cuningputi fascelis JORDAN: TALBOT, 1929: 184–186, pl. 2, fig. 35 uncus; pl. 10, fig. 41 valva, pl. 22, fig. 37 androconium; 1930: pl. 41, fig. 16 ♀v; TALBOT, 1932: 83; ROEPKE, 1955: 201; D'ABRERA, 1971, 1978: 133.

Types — *Delias fascelis* JORDAN, *lectotype* (here designated) ♂, INDONESIA: Irian Jaya — labelled "Mt. Goliath, 5-7000 ft. [1500–2150 m], Centr. Dutch N. Guinea, about 139° long., Januar 1911 (A. S Meek)./*Delias fascelis* Type. 1912. Jord.", in British Museum (Natural History); *paralectotypes* 17 ♂♂ 11 ♀♀ labelled as holotype but i–24. ii. 1911 JOICEY BMNH.

Other material examined — INDONESIA: Irian Jaya — Snow Mountains, 2 ♀♀ 1050 m x. – xii. 1910 MEEK BMNH.

Male — Forewing 25 mm. Upperside: Black border very broad; forewing black border covers distal third of cell; subapical spots faint; hindwing border narrows sharply at M_2 then tapers to a point at tornus; boundary smooth. Underside: forewing disc black with light suffusion of white towards tornus and on veins; postmedian costal spot yellow, not present caudad of R_{4+5} ; hindwing median band narrow, not extending along costa to be continuous with yellow spot in $Sc+R_1-Rs$, reaching dorsum but broken in M_2-M_3 by proximad extension of black border; yellow spots in median band weakly developed in R_s-M_1 , absent in M_1-M_2 and well developed as a series of streaks caudad of M_3 .

Female — Forewing 26 mm. Upperside: forewing black area narrower on dorsum than male but heavy suffusion of black scales over entire cell; large subapical spots; hindwing border narrower than male, tapering towards tornus. Underside: forewing disc creamy white; discal cell predominantly black but with white intrusion across

half the cell distally; postmedian costal spot reduced and yellow; hindwing white median band continuous, reaching dorsum; yellow markings as in male.

Remarks — The three Papua New Guinea species (*cuningputi*, *konokono* and *chimbu*) are more alike to each other than to this species, hence we recognise *fascelis* as an independent species, thus restoring it to its original status.

Distribution — Irian Jaya, known only from Mt. Goliath and Snow Mountains at moderate altitudes (1050–2150 m). It is not certain if this species is anywhere sympatric with *D. fascelis ibelana*.

“*Delias fascelis ibelana*” ROEPKE, 1955, **comb. nov.**

(Fig. 10 ♂, Figs 27, 28 ♀)

Delias cuningputi ibelana ROEPKE 1955 : 201–202, pl. 5, fig. 5 ♂d; D'ABRERA, 1971, 1978 : 133.

Types — *Delias cuningputi ibelana* ROEPKE, *lectotype* (here designated) ♂, INDONESIA : Irian Jaya — Snow Mountains, north side of Mt. Wilhelmina, labelled “Holotype ♂ *Delias cuningputi ibelana* Rpke, det. W. Roepke/Neth. Ind. – Amer. New Guinea Exped., 2600m, Moss Forest Camp, 29.x.1938, L. J. Toxopeus leg.; *D. Cuningputi ibelana* Tox. ♂ Holotype [in Toxopeus' handwriting] Type [red label]”, in Rijksmuseum van Natuurlijke Historie; *paralectotypes* 14♂♂ 1♀ (3 existed), INDONESIA : Irian Jaya — Snow Mountains, 2♂♂ 1♀ (labelled allotype) labelled as lectotype but 21. x. 1938 RL and BMNH (1♂), 12♂♂ Ibele Camp 2250–2300 m 28. x. – 2. xii. 1938 RL and BMNH (2♂♂).

Other material examined — INDONESIA : Irian Jaya — Mulia 1 ♂ 8. ix. 1976 T. NISHIZAWA AS, Wissel Lakes, 1♂ Paniai 2100 m x. 1978 R. STRAATMAN AS; 1♂ no data BMNH.

Male — Forewing 27 mm. Upperside: similar to *fascelis*; forewing subapical spots more prominent. Underside: forewing disc white, sometimes with moderate suffusion of black scales; postmedian costal spot white in R_{4+5} – M_1 , usually continuing to M_2 ; hindwing median band similar to *fascelis* but broader, sometimes continuous in M_2 – M_3 ; yellow markings similar to *fascelis* but absent in Rs – M_1 .

Female — Forewing 26 mm. Upperside: white; similar to *fascelis* but black border slightly narrower and lighter black suffusion in forewing discal cell. Underside: forewing discal area white with greater intrusion into distal part of cell than *fascelis*; costal spot white, reaching M_2 ; hindwing median band broader than *fascelis*; yellow markings fainter and absent cephalad of CuA_1 .

Distribution — Central Irian Jaya between 2000 m and 2700 m, from Wissel Lakes to Snow Mountains. ROEPKE (1955) states that this is a high mountain insect rarely taken below 2000 m.

Remarks — Since the differences between *fascelis* and *ibelana* are less than those between certain populations of *cuningputi* they are considered here to be conspecific. In the absence of more detailed knowledge we retain the existing nomenclature. Neither can be placed with any of the Papua New Guinea species.

Delias citrona JOICEY & TALBOT, 1922
(Figs 14, 15 ♂)

Delias cuningputi citrona JOICEY & TALBOT, 1922 : 307 ; 1924 : pl. 7, fig. 1 ♂dv ; ROEPKE, 1955 : 202.
Delias citrona JOICEY & TALBOT : TALBOT, 1929 : 182 ; TALBOT, 1932 : 83.

Type — *Delias cuningputi citrona* JOICEY & TALBOT, *holotype* ♂, INDONESIA : Irian Jaya — labelled “*Delias citrona* J. & T. 1922/174. DELIAS CITRONA ♂ D. N. Guinea J. & T./55. 21. Menoo River, 3500 – 5000 ft. [1050 – 1500 m], Weyland Mts., Dutch N. Guinea. Dec. '20 – Jan'. 21. C., F., & J. Pratt./Type H. T./JOICEY Bequest. Brit. Mus. 1934-120./Photo taken H. J. C.”, in British Museum (Natural History).

Male — Holotype — Forewing 25 mm. Upperside : pale yellow ; black border similar to *fascelis* but narrower on hindwing. Underside : forewing similar to *fascelis* but orange subapical spots darker ; hindwing median band broad ; yellow spotting as in *ibelana* but everywhere reduced.

Female — Unkown.

Distribution — The one known specimen is from the Weyland Mountains west of the recorded ranges of *D. fascelis fascelis* and *D. fascelis ibelana*.

Remarks — As the holotype is the only known specimen it is not possible to say whether *citrona* represents a good species or an aberration of *fascelis*.

Delias jordani KENRICK, 1909, stat. rev.
(Fig. 8 ♂, Fig. 9 ♀)

Delias jordani KENRICK, 1909 : 181 – 182, pl. 7, fig. 7 ♂dv ; JOICEY & NOAKES, 1915 : 62, pl. 6, fig. 7 ♀dv.

Delias cuningputi jordani KENRICK ; TALBOT, 1929 : 183 – 184, pl. 10, fig. 40 valva, pl. 22, fig. 36 androconium ; 1930 pl. 55, fig. 4 ♀v ; TALBOT, 1932 : 83 ; ROEPKE, 1955 : 202 ; D'ABRERA, 1971, 1978 : 133 ♂v.

Type — *Delias cuningputi jordani* KENRICK, *lectotype* ♂ (here designated), INDONESIA : Irian Jaya — labelled “Momi, 4000 feet [1200 m] Arfak Mountains North New Guinea, Nov. & Dec. 1908. Coll. C. Pratt./Type/Ex Kenrick Coll. B.M. 1933-46/495”, in British Museum (Natural History).

Other material examined — INDONESIA : Irian Jaya — Arfak Mountains, 14♂♂ 4♀♀ Angi Lakes, 1♂Mt Koberae, 1♀ Armassin iii. 1910 C. & F. PRATT BMNH, 1♂ via Manokwari AS.

Male — Forewing 26 mm. Upperside : forewing black border narrow at tornus but curving in from CuA₁ to enter end of discal cell and meeting costa halfway along its length ; hindwing black border narrow, tapering smoothly towards and reaching tornus ; boundary smooth. Underside : forewing disc white ; subapical spots large ; postmedian costal spot not in M₁ – M₂ ; hindwing median band broad, continuous to 1A + 2A but strongly constricted in M₁ – M₂ by extension of proximal black area beyond

cell end; white area continuing along costa as far as basal yellow spot; yellow marking in median band present only in CuA_1-CuA_2 ; yellow spot in cell white distally.

Female — Forewing 25–26 mm. Upperside similar to male but black border wider; forewing with subapical spots. Underside: similar to male; forewing white area more extensive.

Distribution — Irian Jaya, moderate elevations (above 1200 m) in the Arfak Mountains of the Vogelkop.

Remarks — This is a relatively distinct species which cannot be placed with any other (allopatric) members of the group.

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References

- D'ABRERA, B., 1971. *Butterflies of the Australian Region*. 1st edn., 415 pp. Lansdowne, Melbourne.
 ——— 1978. *Butterflies of the Australian Region*. 2nd edn., 415 pp. Lansdowne, Melbourne.
 FRUHSTORFER, H., 1909–1911. Family: Pieridae, Whites. In A. SEITZ *The Macrolepidoptera of the World*. Alfred Kernen, Stuttgart. Vol. 9 The Indo-Australian Rhopalocera; pp. 119–190, pls 51–73.
 GROSE-SMITH, H. G. & W. F. KIRBY, 1901. *Rhopalocera exotica*. Vol. III. *Delias*, viii, ix.
 JOICEY, J. J. & A. NOAKES, 1915. Four new *Delias* and a new *Ornithoptera* from the Angi Lakes, Arfak Mountains, North New Guinea, coll. Messrs. PRATT & sons. *Ann. Mag. nat. Hist.*, (8) 18: 59–62, pls. 4–5.
 JOICEY, J. J. & G. TALBOT, 1922. New forms of the genus *Delias* (Pieridae) from New Guinea, Ceram and Buru. *Bull. Hill Mus. Witley*, 1 (2): 303–309; 1924. 1 (3): pls 7, 8.
 JORDAN, K., 1911. On new or little known *Delias* from New Guinea. *Novit. Zool.* 18: 580–593.
 ——— 1930. Some new butterflies and moths from eastern New Guinea. *Novit. Zool.*, 35: 277–287.
 KENRICK, G. H., 1909. Descriptions of some species of the genus *Delias* from north New Guinea, recently collected by Mr. C. E. PRATT. *Ann. Mag. nat. Hist.*, (B) 4: 176–183, pls 6, 7.
 LEWIS, H. L., 1973. *Butterflies of the World*. 312 pp., 208 pls, Harrap, London.
 ORR, A. G. & A. SIBATANI, 1985. A Revision of the *Delias aroae-cuningputi* Complex (Lepidoptera, Pieridae) 1. The *D. aroae* Group. *Tyô to Ga*, 36: 1–25.
 RIBBE, C., 1900. Neue Lepidopteren aus Neuguinea. *Insekten-Börse*, 17: 308, 330, 346.
 ROEPKE, W., 1955. The butterflies of the genus *Delias* HÜBNER (Lepidoptera) in Netherlands New Guinea. *Nov. Guinea*, 6: 185–260.
 ROTHSCILD, W., 1904. Lepidoptera from British New Guinea, collected by Mr. A. S. Meek. *Novit. Zool.*, 11: 310–317. pls 2, 3.

TALBOT, G., 1928-1937. *A Monograph of the Pierine Genus Delias*. Parts I-VI, 656 pp., 71 pls, British Museum (Nat. Hist.), London.

——— 1932. Pieridae. I. *Lepid. Cat.*, Pars 53. pp. 1-320.

摘 要

ニューギニア島カザリシロチョウ属 *aroae-cuningputi* 複合の分類法の改訂
2. *Delias cuningputi* 群 (Albert G. ORR・柴谷篤弘)

本シリーズ 1 につづき、ニューギニア島高地に産する *Delias cuningputi* 群を定義し、種群に属する 7 類位を記載図示した。この群では 1 に見られた困難がないので、状況に応じて三名式の学名をも用いた。*Delias konokono* と *D. chimbu* の 2 新種を記載し、*D. cuningputi aemula* JORDAN を *D. cuningputi* RIBBE のシノニムとした。

解 説

この論文では、前篇に引きつづき、*D. cuningputi* とその近縁種を記載した。従来 *D. cuningputi* として知られたものは、バプアニューギニアの南斜面タビニ附近から記載された原亜種のほかに、北斜面ワウ附近から記載された *aemula* JORDAN, 西イリアンのゴリアト山附近から記載された *fascelis* JORDAN, ウィルヘルミナ山近傍から記載された *ibelana* ROEPKE, アルファク山地から記載された *jordani* KENRICK の 4 亜種であった。ほかにヴェイラント山地からのただ一頭の♂ホロタイプだけが知られている *D. citrona* JOICEY & TALBOT がある。

近年におけるバプアニューギニア高地での採集が進むにつれて、ここには *cuningputi* に酷似した、同所性の他の 2 新種が産することがわかったので、これらを *D. konokono*, *D. chimbu* として記載した。*D. konokono* は中央高地のほかにタビニ附近の高地にも産し、♂表面前後翅黒縁の幅が広いこと、裏面後翅基部黒斑が中央で外方に突出すること、♀白色中央帯が後縁に達することなどで *cuningputi* から区別される。コノコノというのはチンブー語でチョウを意味し、鼻にかけて平板に発音される。*D. chimbu* は中央高地の西よりの地域に限られて産し、♂は多くは表面地色はやや青灰色を帯びる。また後翅裏面白色中央帯は、基部黒斑が鋭角に外方に突出するため中断されているのが特徴をなす。

D. cuningputi は分布が広く、産地によって少しずつ変異があり、そのもっともいちじるしいのは西部高地ワバグ附近からえられたもので、前翅裏面の黒い地色が退潮して白くなっている。このような広い変異に比べれば、ワウ附近から記載された *aemula* だけを亜種として区別することは意味がないが、さりとて各地の亜種を定義するには、個体変異の幅が広いので、*aemula* を *cuningputi* のシノニムとした。

バプアニューギニアの 3 種 *cuningputi*, *konokono*, *chimbu* に対して従来 *cuningputi* の亜種とされた *fascelis*, *ibelana*, *jordani* を比較すると、それらは *cuningputi* の亜種とすることはできず、さりとて *konokono*, *chimbu* と組みあわせることもできないので、異所性の別種と見られる。このうち *fascelis* と *ibelana* はたいへんよく似ていて同一種の 2 亜種（またはそれ以下）にすぎないが、♂前翅表面の黒縁がきわめて広く翅の外側半分以上を占める点で他の種から区別される。異所性のため *ibelana* を *fascelis* の亜種として残したが、*cuningputi* の地理的変異に比べれば、差はそれより少いとさえ言える。*jordani* は反対に表裏面とも白色部が多く、♂後翅裏面中央白帯が中室端附近で切れている点に特徴がある。

D. citrona は *fascelis* の知られた分布域より西にずれて産するが、明らかにこれと近縁で、♂の表面が淡黄色になっているが、他にもいくつか差があって、おそらく局所的に産する独立種であろうが、1 頭のホロタイプしか知られないので、現時点では判断できない。